Efficient Convex-Elastic Net Algorithm To Solve The Euclideantraveling Salesman Problem

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Summary

This paper describes a hybrid algorithm that combines an adaptive-type neural network algorithm and a nondeterministic iterative algorithm to solve the Euclidean traveling salesman problem (E-TSP). It begins with a brief introduction to the TSP and the E-TSP. Then, it presents the proposed algorithm with its two major components: the convex-elastic net (CEN) algorithm and the nondeterministic iterative improvement (NII) algorithm. These two algorithms are combined into the efficient convex-elastic net (ECEN) algorithm. The CEN algorithm integrates the convex-hull property and elastic net algorithm to generate an initial tour for the E-TSP. The NII algorithm uses two rearrangement operators to improve the initial tour given by the CEN algorithm. The paper presents simulation results for two instances of E-TSP: randomly generated tours and tours for well-known problems in the literature. Experimental results are given to show that the proposed algorithm ran find the nearly optimal solution for the E-TSP that outperform many similar algorithms reported in the literature. The paper concludes with the advantages of the new algorithm and possible extensions